Cells and Heredity

7-2 The student will demonstrate an understanding of the structure and function of cells, cellular respiration, and heredity. (Life Science)

7-2.7 Distinguish between inherited traits and those acquired from environmental factors.
Taxonomy level: 4.1-B Analyze Conceptual Knowledge

Previous/Future knowledge: Students have previously learned about inherited and acquired or learned behaviors in fourth grade (4-2.4) and sixth grade (6-3.7). -

It is essential for students to know that all characteristics that organisms have are inherited from their parents but some can be influenced by environmental factors.

An *inherited trait* is a genetically determined characteristic that distinguishes one organism from another organism. Some inherited traits are dominant, some are recessive, and some are neither.

- An example of an inherited trait in plants may be color of flowers. The color red is dominant over the recessive color white. Pink flowers are a result of a blending of red and white. Other examples of inherited traits may be the shape of seeds or leaves, or the height of the plant.
- An example in animals may be eye color. Brown eye color is dominant over the recessive blue eye color. Green or hazel eyes are neither dominant nor recessive. Other examples of inherited traits may be body design, baldness, blood type, or skin color.

Physical characteristics of organisms may be influenced by environmental factors. Examples of environmental factors that can alter the phenotype of an organism may be temperature, nutrients, injuries, disease, exposure to sun, or living conditions.

- Temperature, for example, may affect the number or size of leaves in plants or the color or amount of fur or thickness of skin in animals.
- Nutrients, for example, may affect the growth or seed production in plants or the weight or height in animals.
- Injuries, for example, may cause scarring in plants and animals.
- Disease, for example, may affect the number of branches in plants or body shape in animals.
- Exposure to sun, for example, may affect the color of leaves in plants or skin changes in animals.
- Living conditions, for example, may affect the leaves, roots and height in plants or the condition of fur, skin, or teeth in animals.

It is not essential for students to understand how mutations or genetic engineering cause changes in inherited characteristics, or causes of genetic disorders.

Assessment Guidelines:
The objective of this indicator is to *distinguish* between inherited traits and those acquired from environmental factors; therefore, the primary focus of assessment should be to differentiate between traits that are inherited from physical characteristics that are influenced by environmental factors. However, appropriate assessments should also require students to *exemplify* traits that would occur due to inheritance or result from environmental factors; or *summarize* major points about inherited traits and traits influenced by environmental factors.